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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/972,178	10/09/2001	Hanae Shimokawa	500.38665CX1	5052

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EXAMINER

ZIMMERMAN, JOHN J

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 12/17/2001

4

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/972,178

Applicant(s)

SHIMOKAWA ET AL.

Examiner

John J. Zimmerman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 09/581,631.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>1</u> . | 6) <input type="checkbox"/> Other: |

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OFFICE ACTION

Priority

1. Foreign priority is acknowledged based on priority papers filed in parent Application No. 09/581,631 under 35 U.S.C. 119(a)-(d).

Information Disclosure Statement

2. The Information Disclosure Statement received October 9, 2001 has been considered. An initialed form listing the references is enclosed with this Office Action.

Claim Objections

3. Claim 35 is objected to because of the following informalities: The phrase "he lead" (line 1" should be "the lead". Appropriate correction is requested.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground

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provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1-39 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-13 of copending Application No. 09/581,631. Although the conflicting claims are not identical, they are not patentably distinct from each other because the scope of the pending claims of this application and the scope of the claims of the copending application overlap. The claims of both applications are directed to the same invention of using a Sn-Bi alloy layer on electronic articles and the use of lead free solders on these layers. There is no patentable distinction between the two sets of pending claims. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

7. Claims 1, 3-6, 8-11, 14-15, 18-19, 21-24, 27 and 34-36 are rejected under 35

U.S.C. 102(b) as being anticipated by Shimokawa (WO99/30866).

8. Shimokawa (WO99/30866) was published more than one year prior to the filing date of this application. Although it is noted that Shimokawa (WO99/30866) is a priority document for this pending application, the rejected claims in this application are not entitled to the priority to the parent application because they contain matter that cannot be found in the parent application. Specifically, the rejected pending claims are drawn to "a Pb-free solder comprising Bi" (e.g. pending claims 1, 3-6, 8-11, 14-15, 18-19, 21-24 and 27) and no such solder of the scope "comprising Bi" has been described in the parent application. It should be noted that the claimed parentage/priority of this application only provides priority for claims in this application which have complete support through the lineage of the parent/priority applications. When a pending claim contains any limitation (e.g. "a Pb-free solder comprising Bi") which cannot be found in a parent application, then the priority for that claim ends with the last continuous uninterrupted line of support. Applicant may wish to consult MPEP 201.11. A review of the pending claims in this application shows that the rejected claims contain matter of a scope that cannot be traced back to filing date effective to remove applicant's previously published application to Shimokawa

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(WO99/30866). On the issue of whether applicant's own foreign publications may be used as prior art, applicant may wish to consult *In re Langenhoven*, 173 USPQ 426 (CCPA 1972); *In re Lukach, Olson, and Spurlin*, 169 USPQ 795 (CCPA 1971); *In re Ruscetta and Jenny*, 118 USPQ 101 (CCPA 1958); *Chromalloy American Corp. v. Alloy Surfaces Co., Inc.*, 173 USPQ 295 (D. Del. 1972). Note also that these cases support that a species may anticipate a genus and affirm that applicant's own foreign publications can even be combined with other prior art to bar a U.S. patent in an obviousness rejection. In addition, it is not clear where the parent application provides support for the negative limitation "without any plating layer between the lead and the Sn-Bi alloy plating layer (e.g. claim 34, line 3) and therefore claims 34 and 35 do not appear to have a continued line of support through the parent application. See MPEP 2173.05(i) for a discussion on negative limitations. Any negative limitation must have a basis or exclusionary proviso on the original specification, *Ex parte Grasselli*, 231 USPQ 393. The mere fact that intermediate layers may not have been disclosed between the lead and the Sn-Bi plating layers is not support for the specific exclusion of intermediate layers by the use of a negative limitation. Claims 2, 7, 12-13, 16-17, 20, 25-26, 28-33 and 36-39 appear to have continuing support through the parent application and are therefore not rejected over Shimokawa (WO99/30866).

9. Claim 28 is rejected under 35 U.S.C. 102(b) as being anticipated by Matsumoto (Japanese publication 08-132277).

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10. Matsumoto discloses applying Sn-Bi alloy compositions to leads of semiconductor devices (e.g. see paragraph [0001] and Table 2).

11. Claims 32 and 34 are rejected under 35 U.S.C. 102(e) as being anticipated by Tanimoto (U.S. Patent 6,110,608).

12. Tanimoto discloses forming lead material with a solder coating which may be a Sn-7%Bi-3%Ag alloy (e.g. see Example 33 in Table 3).

13. Claims 1-2, 5-7, 10-19, 28, 30, 34 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakanishi (Japanese publication 10-041621).

14. Nakanishi discloses forming solder connections by plating a tin-bismuth alloy surface treatment (e.g. see Figure 1b, numeral 7) onto an electrode of Ni or Cu. The surface treatment Sn-Bi may contain 10% Bi (e.g. see paragraph [0023]). Solder comprising tin-bismuth (e.g. see Figure 1b, numeral 5) is applied and this solder may contain silver (e.g. see paragraph [0027]). The solder alloys do not contain any lead.

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Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 1-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanimoto (U.S. Patent 6,110,608).

17. Tanimoto discloses forming electronic lead materials with a first coating of Sn-Bi alloy and a second solder coating which may be a Sn-Bi-Ag alloy (e.g. see column 3, line 63 - column 4, line 62). Specific examples of the Sn-Bi and Sn-Bi-Ag materials can be found in the tables (e.g. see Example 33 in Table 3 for specific Sn-Bi-Ag composition considered part of Tanimoto's invention and also see Example 44 in Table 3 which shows that the use of dual Sn layers containing Bi is part of Tanimoto's invention). The electrodes of Tanimoto may be copper plated (e.g. see column 6, lines 33-44). Tanimoto even discloses Sn-10%Bi plated without an intermediate layer or a second plated layer in Comparative Example 5 of Table 3. Tanimoto may differ from the claims in that Tanimoto may not have an example in the tables with Sn-Bi next to Sn-Bi-Ag solder. However, Tanimoto is not required to have made specific examples of each of his embodiments and Tanimoto clearly describes the compositions and requirements of his layers

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(e.g. see column 3, line 63 - column 4, line 62) and clearly discloses that the combinations of these disclosed layers are considered his invention. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use all the embodiments disclosed by Tanimoto because Tanimoto discloses that combinations of his disclosed layers are his invention. In addition, Tanimoto may not disclose the use of various substrates (e.g. Fe-Ni alloy) or various types of leads (e.g. TSOP leads). However, the examiner takes Official Notice that Fe-Ni alloy is conventionally used in the art as an alternative to copper alloy leads for semiconductor devices and the examiner also takes Official Notice that thin small outline package devices (TSOP) are conventional chip packages in the art. These alternative use of Fe-Ni alloy leads and the conventional use of TSOP devices is so well known in the art that Official Notice can be taken on these issues. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Fe-Ni alloys for the leads of Tanimoto because Fe-Ni alloys are understood in the art to be obvious alternatives to copper alloys for leads when thermal expansion issues, strength and expense are issues. In addition, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the compositions of the reference for TSOP devices because Tanimoto clearly discloses the use for analogous devices and it would be understood that leads of TSOP devices would benefit from the same coating compositions.

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18. Claims 29-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto (Japanese publication 08-132277).

19. Matsumoto discloses applying Sn-Bi alloy compositions to leads of semiconductor devices (e.g. see paragraph [0001] and Table 2). Matsumoto may differ from the claims in that Matsumoto may not disclose the use of various substrates (e.g. Fe-Ni alloy) or various types of leads (e.g. TSOP leads). However, the examiner takes Official Notice that Fe-Ni alloy is conventionally used in the art as an alternative to copper alloy leads for semiconductor devices and the examiner also takes Official Notice that thin small outline package devices (TSOP) are conventional chip packages in the art. These alternative use of Fe-Ni alloy leads and the conventional use of TSOP devices is so well known in the art that Official Notice can be taken on these issues. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Fe-Ni alloys for the leads of Matsumoto because Fe-Ni alloys are understood in the art to be obvious alternatives to copper alloys for leads when thermal expansion issues, strength and expense are issues. In addition, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the compositions of the Matsumoto for TSOP devices because the reference clearly discloses the use for analogous devices and it would be understood that leads of TSOP devices would benefit from the same coating compositions.

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20. Claims 3-4, 8-9, 19-27, 29, 31, 33 and 35-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi (Japanese publication 10-041621).

21. Nakanishi discloses forming solder connections by plating a tin-bismuth alloy surface treatment (e.g. see Figure 1b, numeral 7) onto an electrode of Ni or Cu. The surface treatment Sn-Bi may contain 10% Bi (e.g. see paragraph [0023]). Solder comprising tin-bismuth (e.g. see Figure 1b, numeral 5) is applied and this solder may contain silver (e.g. see paragraph [0027]). The solder alloys do not contain any lead. Nakanishi may differ from the claims in that Nakanishi may not disclose the use of various substrates (e.g. Fe-Ni alloy) or various types of leads (e.g. TSOP leads). However, the examiner takes Official Notice that Fe-Ni alloy is conventionally used in the art as an alternative to copper alloy leads for semiconductor devices and the examiner also takes Official Notice that thin small outline package devices (TSOP) are conventional chip packages in the art. These alternative use of Fe-Ni alloy leads and the conventional use of TSOP devices is so well known in the art that Official Notice can be taken on these issues. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Fe-Ni alloys for the leads of Nakanishi because Fe-Ni alloys are understood in the art to be obvious alternatives to copper alloys for leads when thermal expansion issues, strength and expense are issues. In addition, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the compositions of the Nakanishi for TSOP devices because the

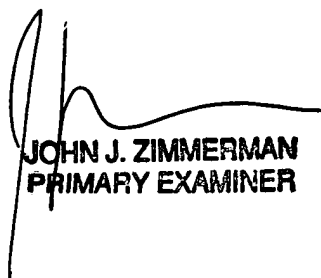
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reference clearly discloses the use for analogous devices and it would be understood that leads of TSOP devices would benefit from the same coating compositions.

Conclusion

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. This additional prior art serves to further establish the level of ordinary skill in the art.

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Zimmerman whose telephone number is (703) 308-2512 and whose fax number is (703) 872-9310.



**JOHN J. ZIMMERMAN
PRIMARY EXAMINER**

jjz
December 12, 2001